

REMARKS/ARGUMENTS

Claims 4 and 17 are amended. Claims 24-36 are canceled. New claims 37-38 have been added. Claims 2-23 and 37-38 are now pending.

The Examiner has indicated that the first listed parent case identified in the first paragraph of page 1 of the specification has been abandoned, and should be indicated as such. Accordingly, the specification has been amended to reflect this abandonment.

The Examiner has required that the non-elected claims be canceled. Non-elected claims 24-36 are canceled in this amendment.

The Examiner has not seen PTO-1449; Japan 09/508241. Its publication date is August 9, 1997. An English language equivalent is WO 96/15551, which was submitted in an IDS submitted May 17, 2004. Applicants have not submitted another copy herewith due to its size, but would be happy to do so upon request.

Claims 3, 4, 7, 17-23 have been objected to as containing the undefined terms "unsingulated" and "singulated". Applicants direct the Examiner's attention to page 26, lines 12-14, and page 32, lines 7-9 of the specification as filed for descriptions of dies that are not singulated and dies that are singulated, respectively. Singulation is the process, well-known to those skilled in the art, of separating a wafer containing multiple circuits or dies into individual dies, such as by saw-cutting the wafer between the dies located thereon. Applicants respectfully request that this objection be withdrawn.

Claims 4 and 17 have been objected to for containing terms lacking antecedent basis. Accordingly, claims 4 and 17 have been amended to provide proper antecedent basis.

Figs. 8, 8A, 8B and related material in the specification have been objected to as being unclear. The Examiner's attention is directed to page 25, line 31, through page 27, line 2 of the specification as filed. In particular, most of the elements shown in Figs. 8 and 8A are described on page 26, lines 20-26. Wafer testing system 800 includes a single socket substrate 804 for receiving the interconnection elements of wafer under test (WUT) 802. In Fig. 8A, WUT 802 is shown positioned below socket substrate 804, with interconnection elements shown therebetween. In Fig. 8 (a bottom view in relation to Fig. 8A), WUT 802 (the middle circle) is shown covering socket substrate 804 (the outer circle) so that the interconnection elements are not seen. Neither WUT 802 nor socket substrate 804 is hollow. Contact pads 806, such as for connecting socket substrate 804 with external test equipment, can be seen on the periphery of

socket substrate 804 in Figs. 8, 8A (and 8B). Socket substrate 804 is analogous to a probe card, however, the interconnection elements are located on WUT 802 rather than on socket substrate 804 (page 26, lines 3-4), as described in previous embodiments in the specification. In light of the above, Applicants respectfully request that this objection be withdrawn.

Claim 10 has been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement with regard to the disclosure of thermal chucks in context of claimed subject matter. For the reasons given below, Applicants respectfully traverse this rejection.

The use of a chuck to position a wafer and remove heat from it during test or burn-in is well-known to those skilled in the art. As shown in Fig. 8A, WUT 802 is positioned by thermal chuck 812, and socket substrate 804 is positioned by thermal chuck 814. Thermal chucks 812 and 814 serve to remove unwanted heat from WUT 802 and socket substrate 804, which is generated by operating the semiconductor devices on WUT 802, as disclosed on page 26, lines 24-26. Therefore, Applicants have fully complied with 35 U.S.C. 112, first paragraph, and the rejection should be withdrawn.

The drawings have been objected to under 37 CFR 1.83(a) for not showing every feature of claim 10 in combination with claim 2. For the reasons given below, Applicants respectfully traverse this rejection.

The features of claim 10 are shown in Figs. 8A and 8B. The features of claim 2 are shown in Figs. 6, 6A and 7. One skilled in the art can readily appreciate that WUT 802 of Fig. 8A can be replaced with the plurality of semiconductor devices 702 of Fig. 7, and socket substrate 804 of Fig. 8A can be replaced with the combination of the plurality of socket substrates 704 mounted on support substrate 708 of Fig. 7, to form the invention having the features of claim 10 in combination with claim 2. Making such an arrangement is taught on page 26, line 3-8 of the specification. Accordingly, Applicant's respectfully submit the rejection is improper and should be withdrawn.

Claims 2-5, 7, 8, 14-18, 20-23 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Wood in view of Raymond. Applicants respectfully traverse this rejection.

The present invention, as defined for example by claim 2, is directed to socketably receiving at least one *elongate* interconnection element extending from an electronic component. The electronic component can be a bare semiconductor die, either by itself (singulated) or still

resident on a wafer with other dies (unsingulated). The bare die need not be packaged. In fact, it is preferable that the die having the elongate interconnection element not be packaged so that the present invention can be used to test or burn in the die during fabrication, and/or be used in lieu of packaging to save cost, reduce space and increase reliability when connecting the die to other electronic components for operation.

Because the interconnection elements of the present invention are *elongate*, they are particularly well-suited to making interconnection to modern microelectronic devices at a fine-pitch. Page 2, lines 25-26 of the specification. As used in this application, the term “fine-pitch” refers to microelectronic devices that have their terminals disposed at a spacing of less than about 5 mils, such as 2.5 mils. Page 2, lines 26-29. Such fine-pitch interconnections are often required when interconnecting with bare, unpackaged die described above.

In rejecting claims 2-5, 7, 8, 14-18, 20-23, the Examiner indicates that the invention of Wood lacks spring connection elements, and relies on Reymond to provide these. However, the connection elements of Reymond cannot be considered *elongate* as required by claim 1 of the present invention. The non-elongate contacts taught by Reymond are used for interconnecting circuit boards, integrated circuit *packages* and the like. Col. 1, lines 23-39, and Col. 3, line 25 through Col. 4, line 46. Nowhere does Reymond teach or suggest that the non-elongate contacts could be used in fine-pitch applications such as for testing, burning in, or permanently mounting *unpackaged* integrated circuits.

For the above reasons, independent claims 2 and 17 patentably distinguish over the cited combination of Wood and Reymond. For at least these same reasons, claims 3-16 which depend from claim 2, and claims 18-23 which depend from claim 17, also distinguish over the cited combination. Moreover, claims 3-16 and 18-23 recite additional features that further distinguish over the cited combination.

For example, claim 3 recites that the “plurality of semiconductor devices are dies of an unsingulated semiconductor wafer.” As discussed above, none of cited references, taken alone or in combination, teaches or suggests using an unsingulated semiconductor wafer as recited in claim 3. As another example, claim 7 recites that the “semiconductor devices are unpackaged, singulated semiconductor dies.” While Wood teaches the testing of semiconductor devices that are unpackaged, singulated semiconductor dies, there is no suggestion in either Wood or Reymond how one skilled in the art could attach the contacts of Reymond to the unpackaged,

singulated semiconductor die of Wood to arrive at the present invention as defined by claim 7.
Claims 3 and 7 thus further distinguish over Wood in view of Reymond.

New dependant claims 37 and 38 have been added and recite that the elongate spring connection elements have a pitch of less than about 5 mils. Such a feature further distinguishes over the combination of references cited.

Conclusion:

Claims 2-23 and 37-38 are pending in the application. Applicants believe that the application is in condition for allowance and request an early notice of allowance. If at any time the Examiner believes a discussion with Applicants would be helpful, the Examiner is invited to contact the undersigned at (925) 290-4031.

Respectfully submitted,

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